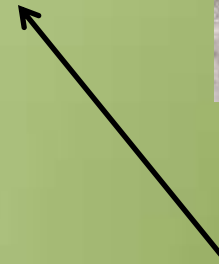
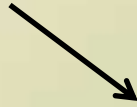


# Managing Habitats for Sage-Grouse: Do We Need a Sagebrush Management Decision Support Tool?

Clint McCarthy  
Regional Wildlife Ecologist  
Intermountain Region  
Forest Service



# What are Sagebrush Management Implications for Sage-Grouse Conservation ?



# Questions:

- How do we assess and implement sagebrush management options to enhance sage-grouse habitats?
  - Where do we focus habitat management that will have meaningful outcomes for sage-grouse?
  - What are the implications for management given changes in landscapes and disturbance regimes?
  - What are the array of management options?
  - When is vegetation treatment appropriate?
  - What are the uncertainties and risks associated with management?

# Discussion Main Points

- Listing of Greater Sage-Grouse and Rationale
- Multi-scale considerations in managing habitats for sage-grouse
  - Landscape Scale Considerations
  - Site Scale Considerations
- Availability of Information
- Need for integration of information into a decision support process

# 2010 Listing Finding

- FWS proposes listing of sage-grouse
- “Warranted, but precluded...”
  - Greater sage-grouse
    - Ranked as a Category 8 Candidate Spp.
  - Bi-state sage-grouse
    - 3% range of Greater Sage-Grouse
    - Identified as a Distinct Population Segment
    - Ranked as a Category 3 Candidate Spp.





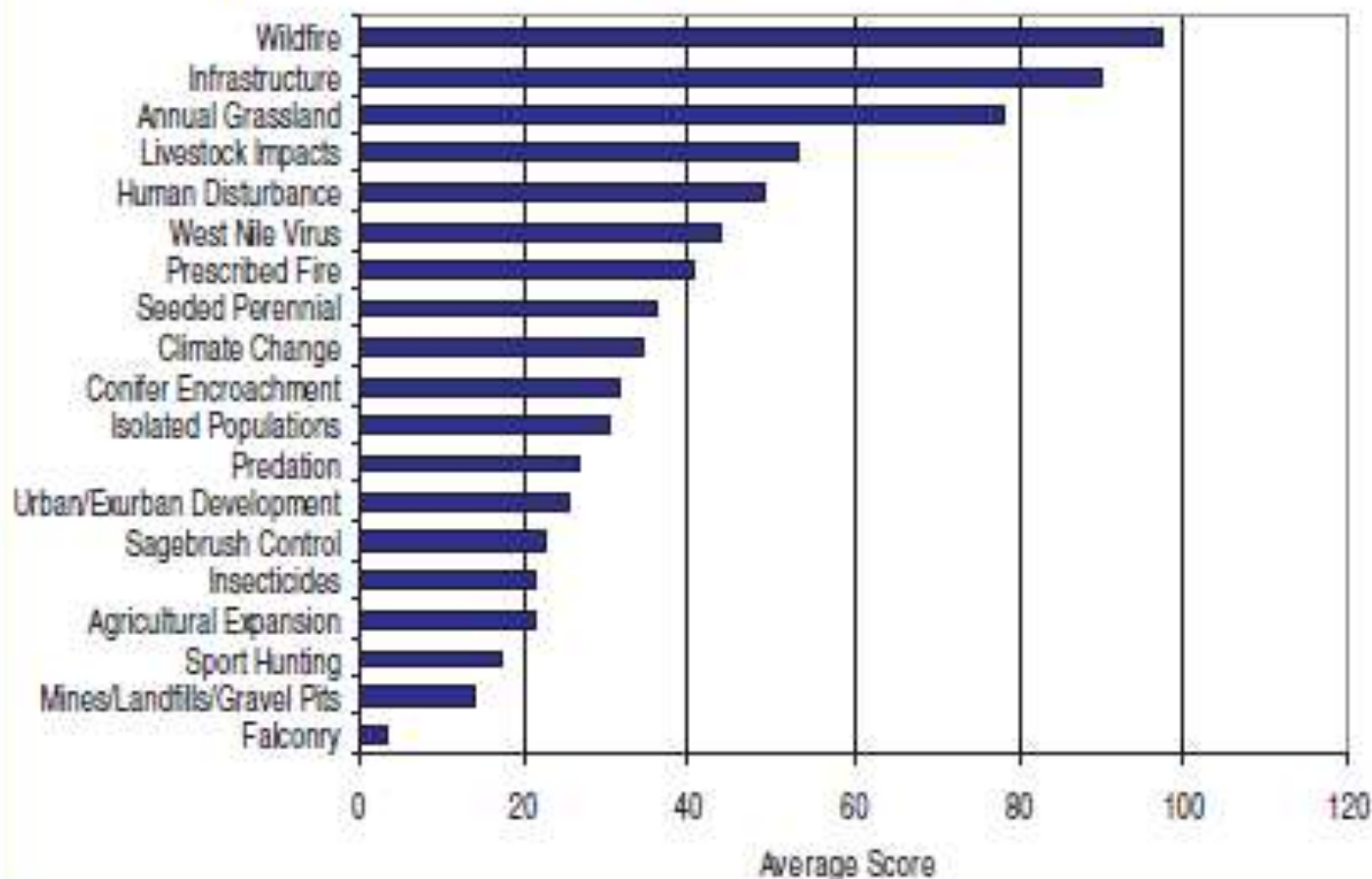
# Primary Threats



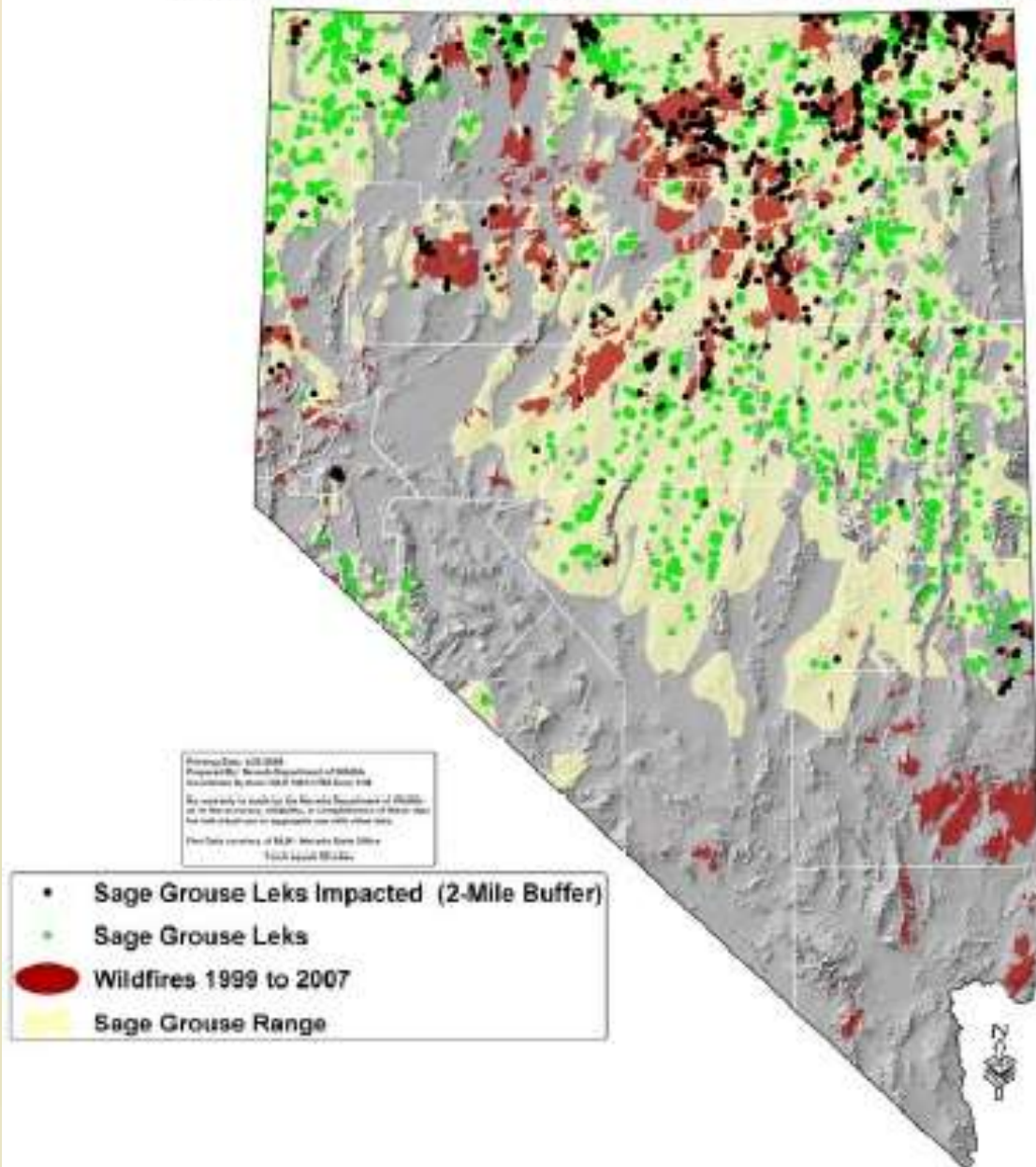
- Loss and Fragmentation of Habitats
  - Energy Development (i.e. 79% decline in NE WY)
  - Invasive Species and Fire
    - Disruption of historic fire cycles
    - Shift from shrub-steppe to annual grassland
      - 27% of sagebrush habitats in the Great Basin have burned since 1981
  - Agriculture
    - Conversion of sagebrush habitat



## Relative Ranking of Threats to Sage-Grouse in Idaho



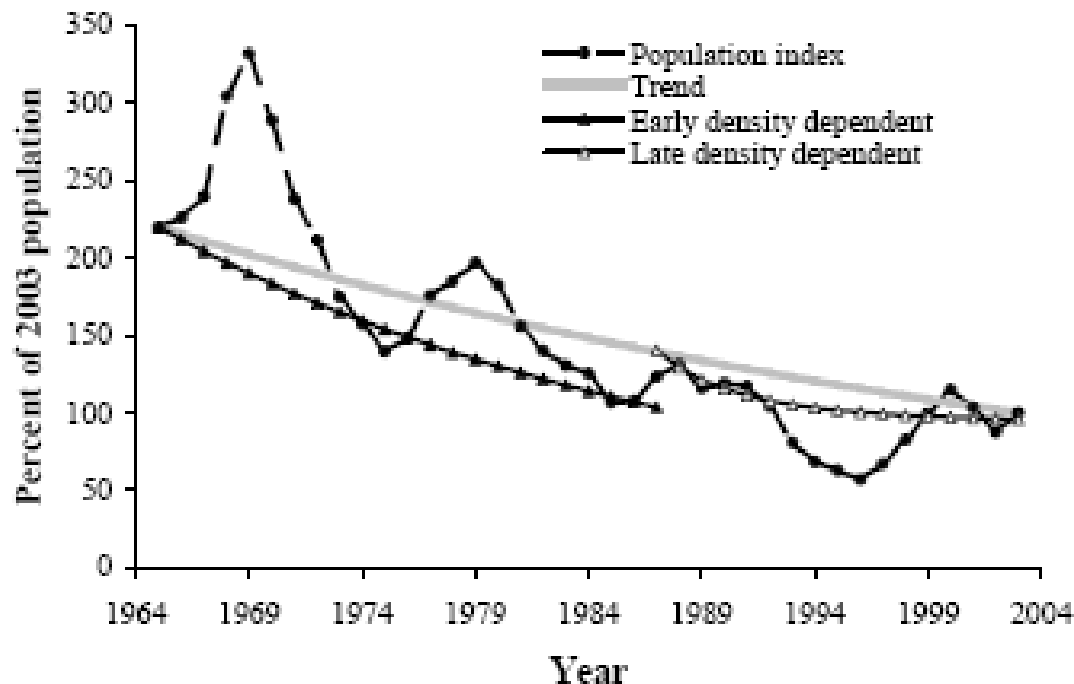
## Effects of Wildfires (1999 to 2007) on Greater Sage-grouse

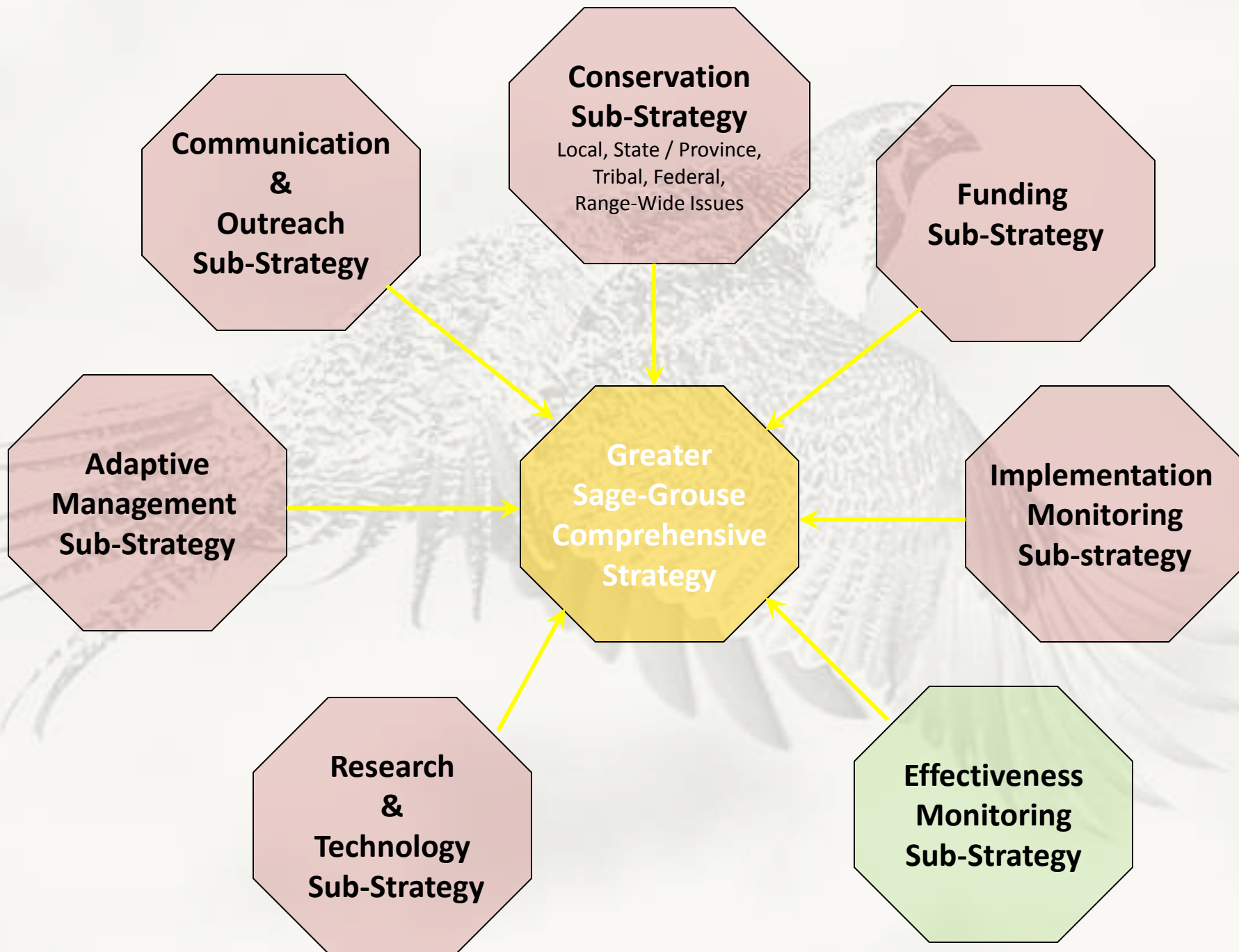




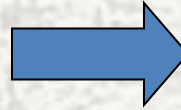
# Guidance from the Greater Sage-Grouse Comprehensive Conservation Strategy (2006)

The overall goal of the Range-wide Strategy is to maintain and enhance populations and distribution of sage-grouse by protecting and improving sagebrush habitats and ecosystems that sustain these population.





# Greater Sage-Grouse Comprehensive Conservation Strategy



**Habitat Management  
and Monitoring**

**Population Monitoring**

# Habitat Assessment Framework

## Primary Goals

- Understanding the life history requisites of sage-grouse
- Understanding ecological processes and function of the sagebrush ecosystem
- Assessing species/habitat relationships at multiple scales (e.g. species, populations, home ranges, site)
- Identify limiting factors for sage-grouse at these various scales



# THE SEARCH FOR CONTEXT

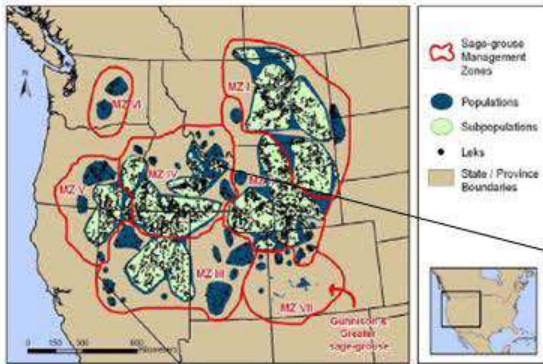
## (Fine and Coarse Scale Considerations)

7/20/86

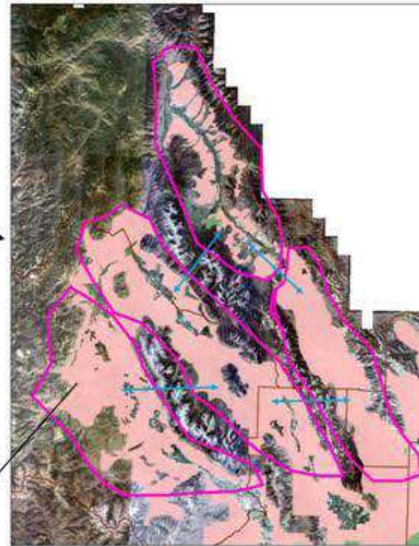




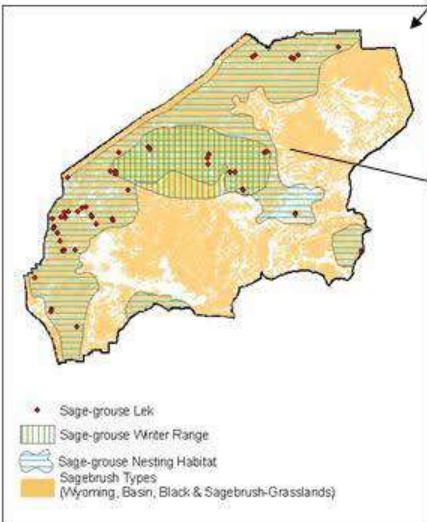
First Order Selection:  
Species and population range



Second Order Selection:  
Subpopulation areas, dispersal between sub-populations



Third Order Selection:  
Home-range of small/isolated populations, sub-populations, or group of birds associated with a cluster of leks, movement between seasonal ranges (breeding to summer).



Fourth Order Selection:  
Seasonal habitats, movement between daily use areas (feeding to roosting, nesting to feeding, feeding to loafing).



# Habitat Assessment Framework

## Orders of Selection for Greater Sage-Grouse

Landscape

Coarse Scale



Site



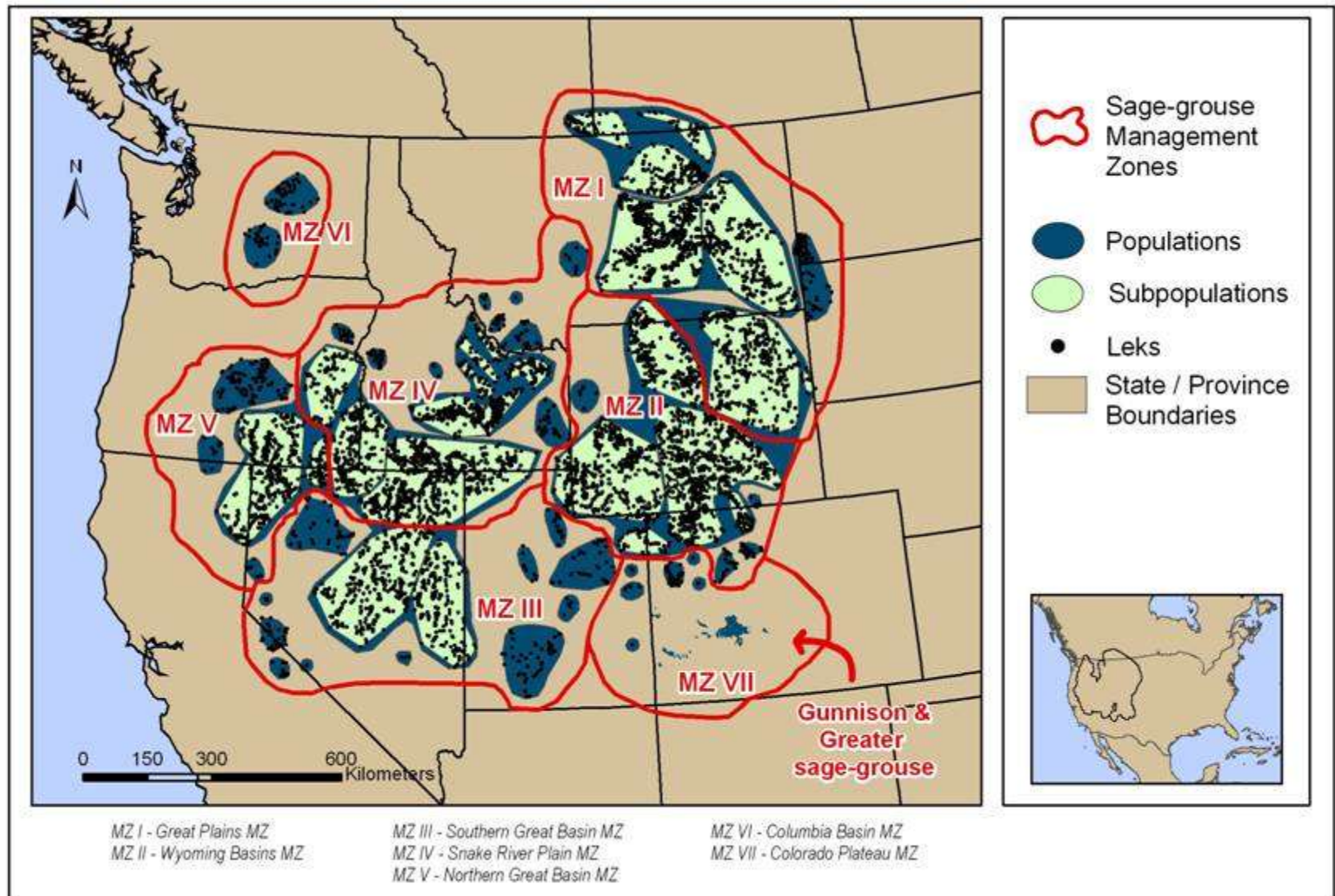
Fine Scale

# Coarse (Landscape) Scale

## Sage-Grouse as a Landscape Species

- Northern and Southern Great Basin Management Zones comprise a large portion of the western population stronghold
- Require large extensive sagebrush landscapes
- Life History Requisites can occur over large areas
  - Importance of sagebrush landscapes for food and cover during specific life history periods
  - Connectivity of sagebrush habitats within and between seasonal habitats
- Fine scale management actions in sagebrush habitat need to consider this larger landscape

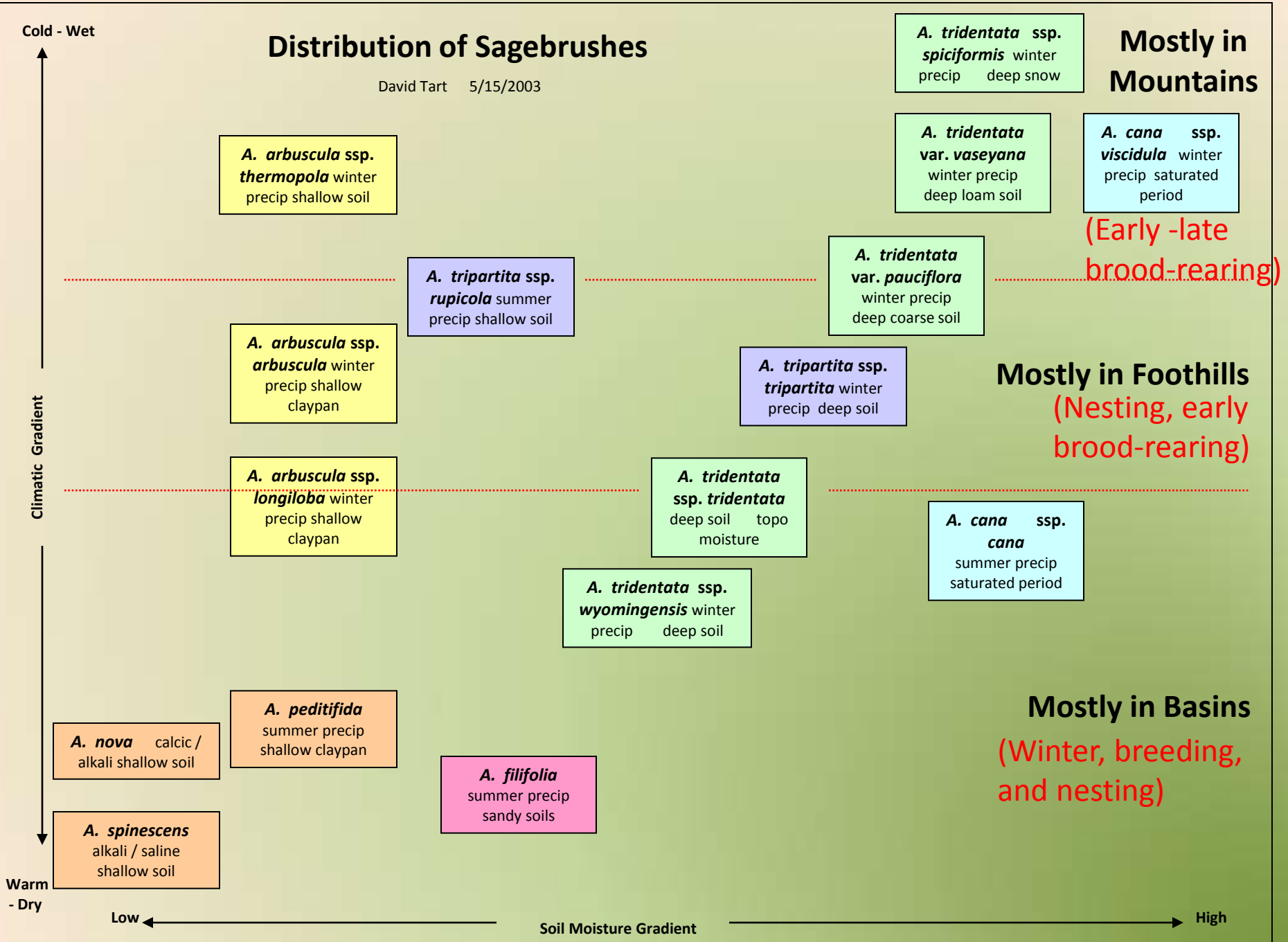
# Greater Sage-Grouse Comprehensive Conservation Strategy – Management Zones





# Distribution of Sagebrushes

David Tart 5/15/2003

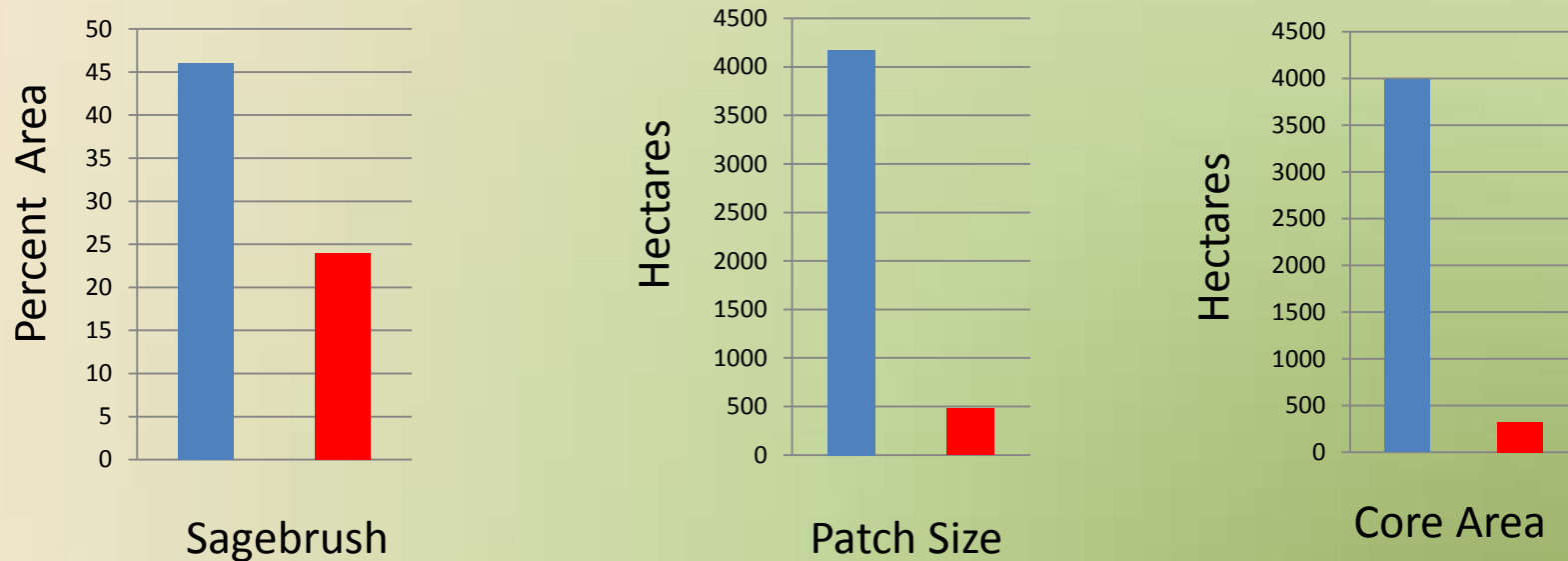


# Key Landscape Issues In the Great Basin

- Loss and fragmentation of sagebrush habitats due to wildfire and the establishment of annual grassland communities
- Loss and fragmentation of sagebrush habitats due to encroachment of pinyon and juniper habitats
- Loss and fragmentation of sagebrush habitats due to infrastructure development



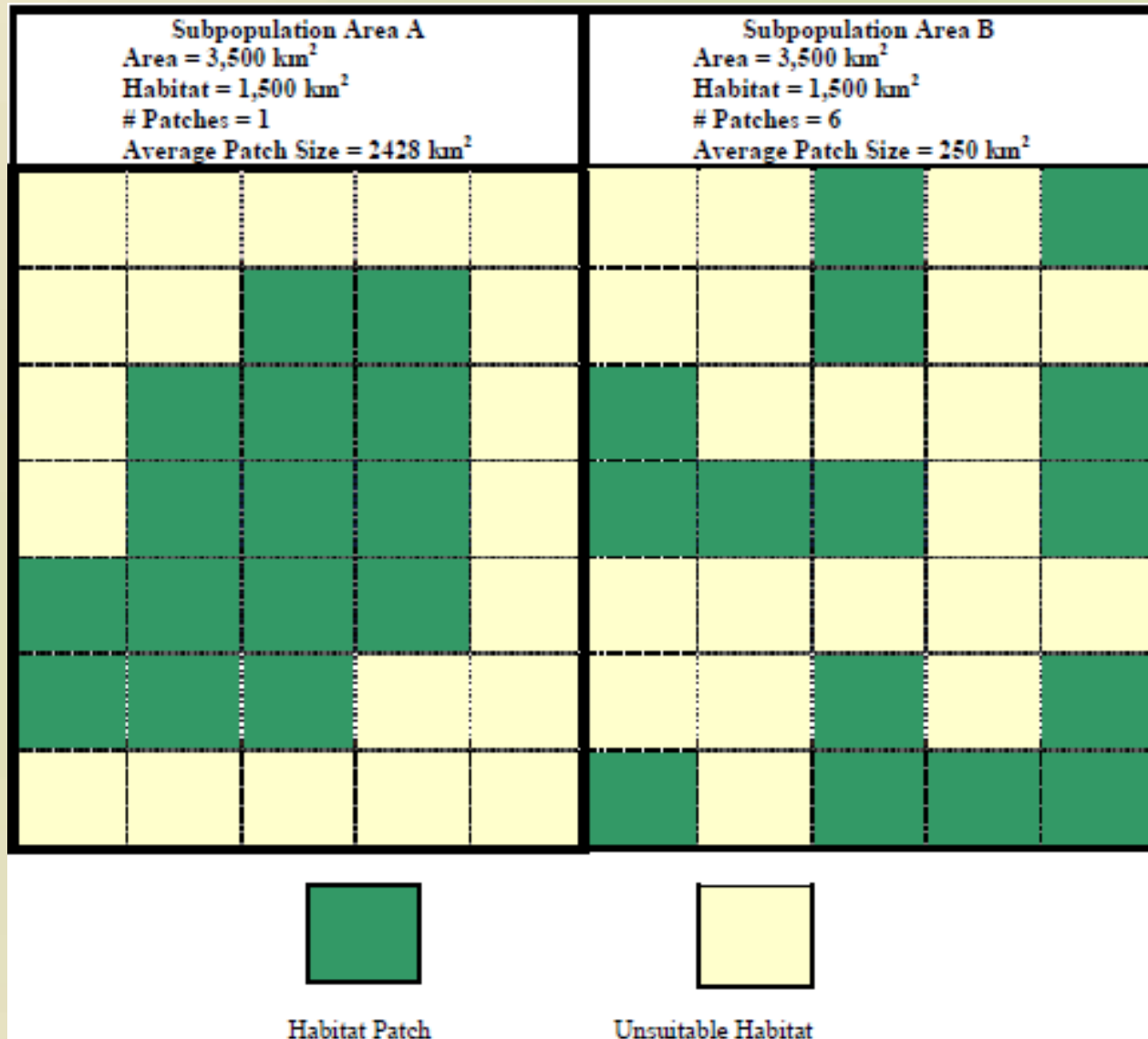
# Selected Landscape Attributes for Comparing Sage-Grouse Occupied vs Extirpated Habitats



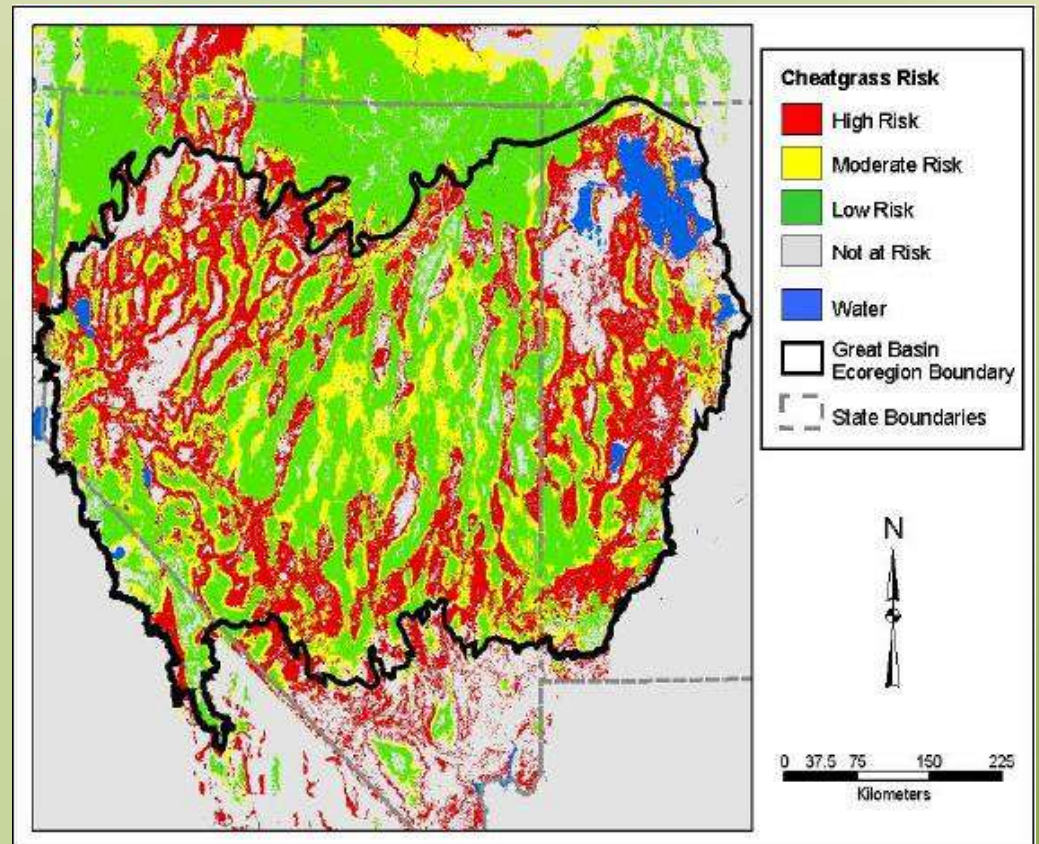
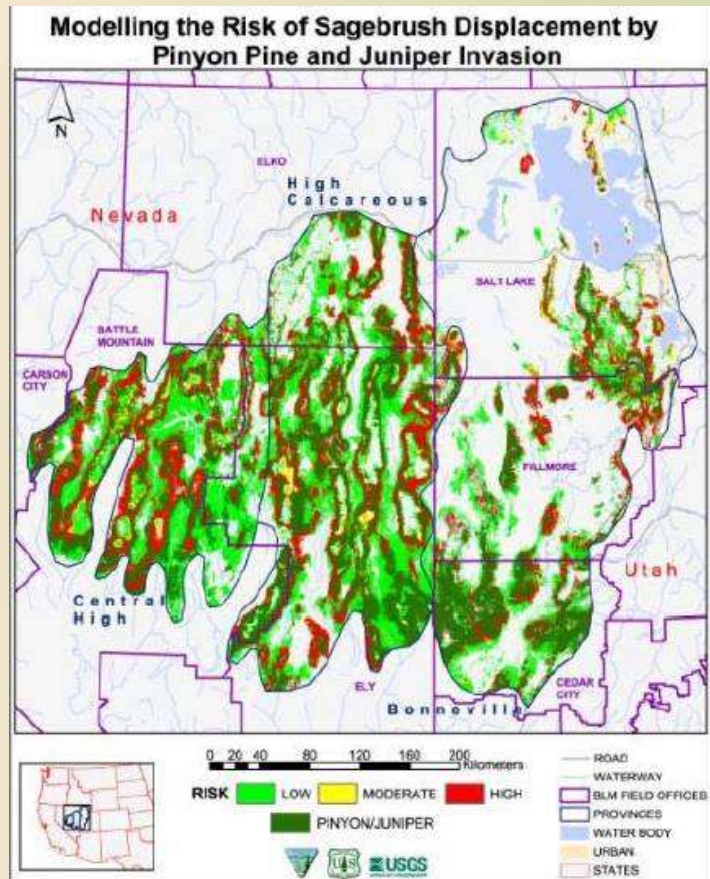
Comparison of selected landscape variables in 239 historical populations in occupied range and 136 historical populations in extirpated range.

(Wisdom et al. 2010)

# Importance of Patch Assemblages and Connectivity



# Pinyon/Juniper and Cheatgrass Risk Analysis Great Basin Ecoregion

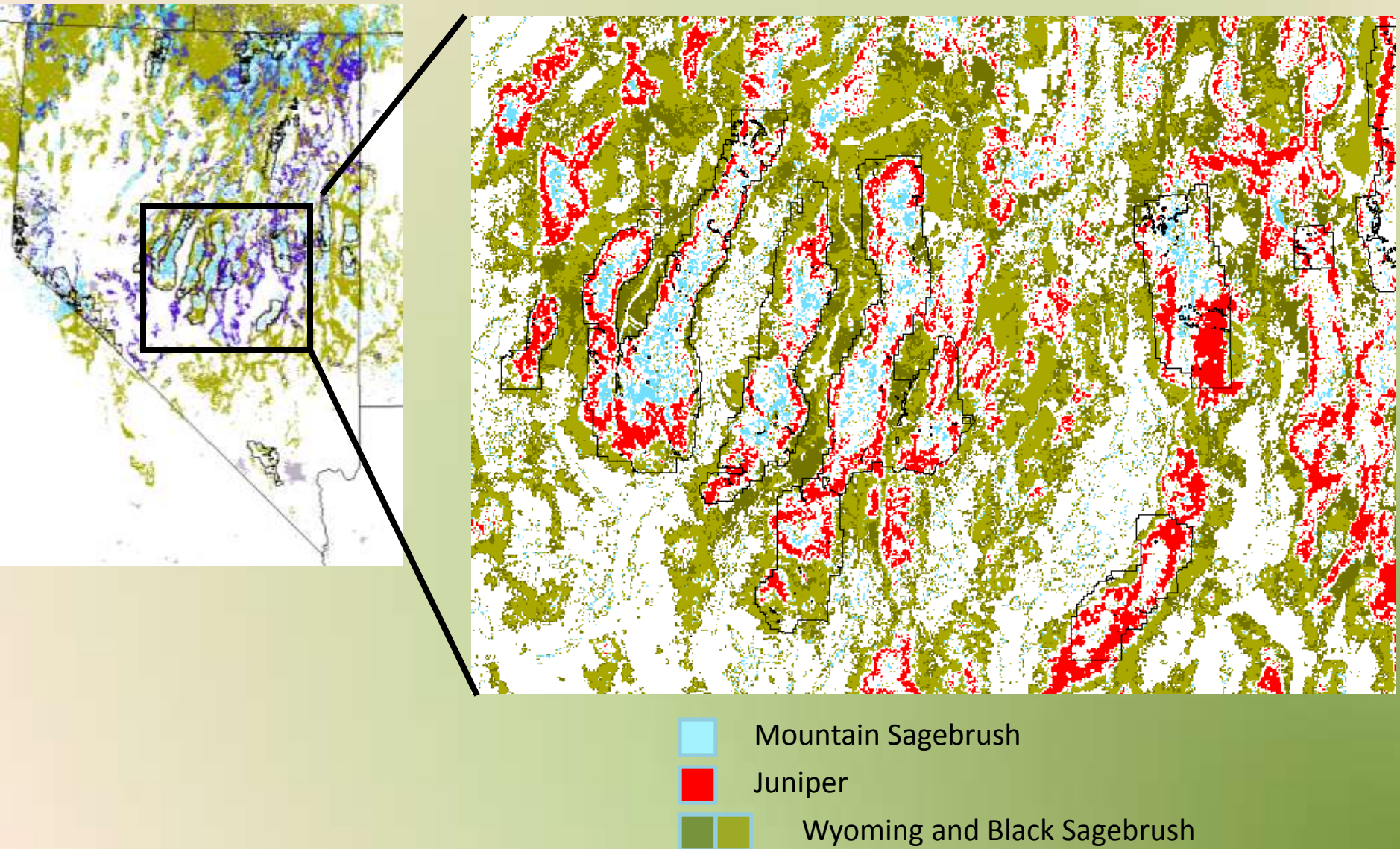


Wisdom et al. 2003



# Pinyon/Juniper and Sagebrush Types

## Humboldt-Toiyabe National Forest (GAP Analysis)



# Fine Scale (Home Ranges and Sites ) Sage-Grouse Habitat Selection in

- Site scale characteristics that comprise sage-grouse habitats – fitting species to habitat
- Site potential of these sagebrush communities
- Biotic and abiotic factors affecting the composition and structure of these communities



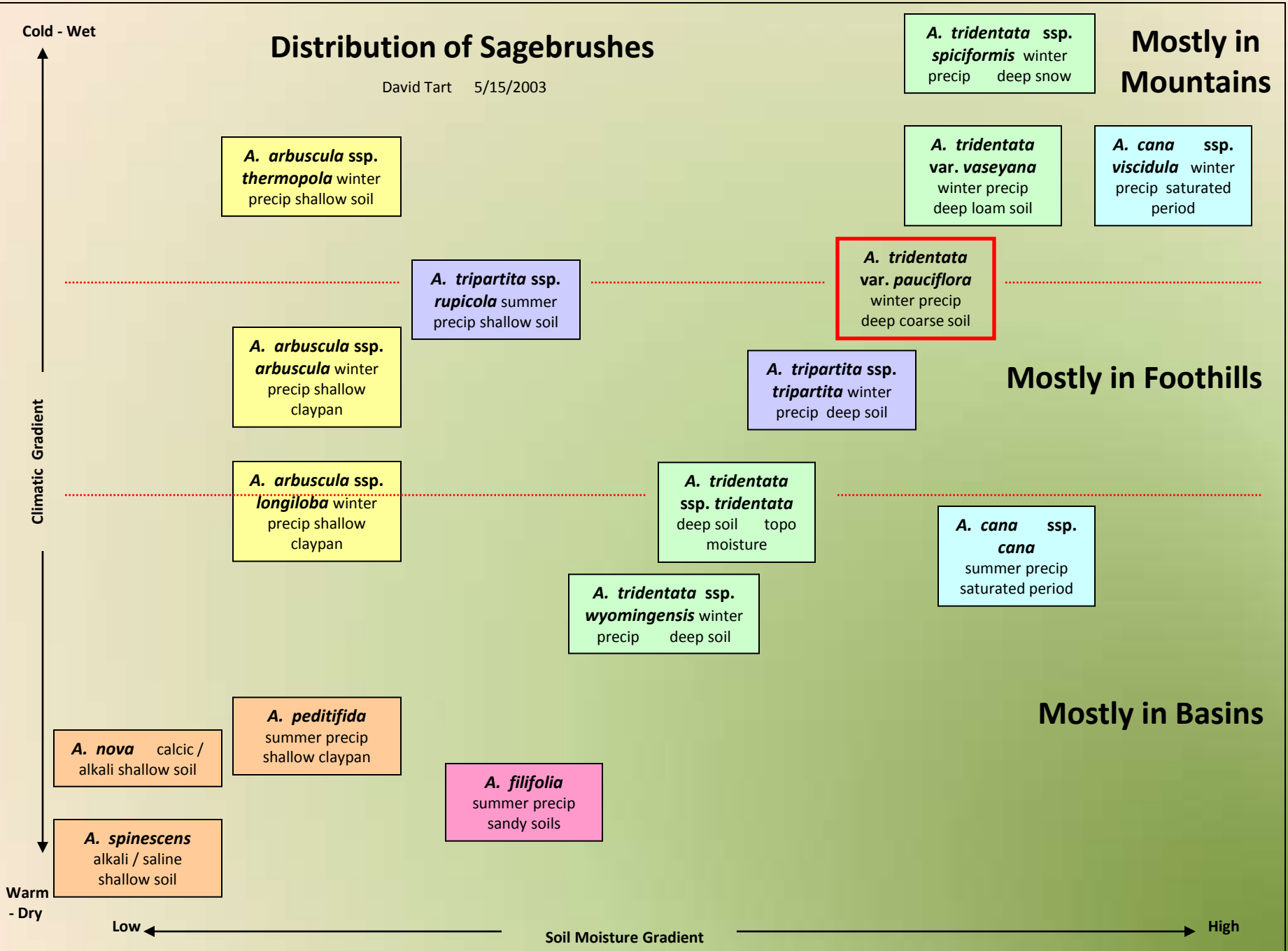
# Fitting Sage-Grouse Guidelines to Habitats - Fine Scale Considerations

	Nesting		Brood Rearing		Winter	
	Height(cm)	Canopy(%)	Height(cm)	Canopy(%)	Height(cm)	Canopy(%)
<b>Mesic Sites</b>						
Sagebrush	40-80	15-25	40-80	10-25	25-35	10-30
Grass-Forb	≥ 18	≥ 25	Variable	≥ 15	NA	NA
<b>Arid Sites</b>						
Sagebrush	30-80	15-25	40-80	10-25	25-35	10-30
Grass-Forb	≥ 18	≥ 15	Variable	≥ 15	NA	NA
<b>% of Area</b>	>80		>40		>80	

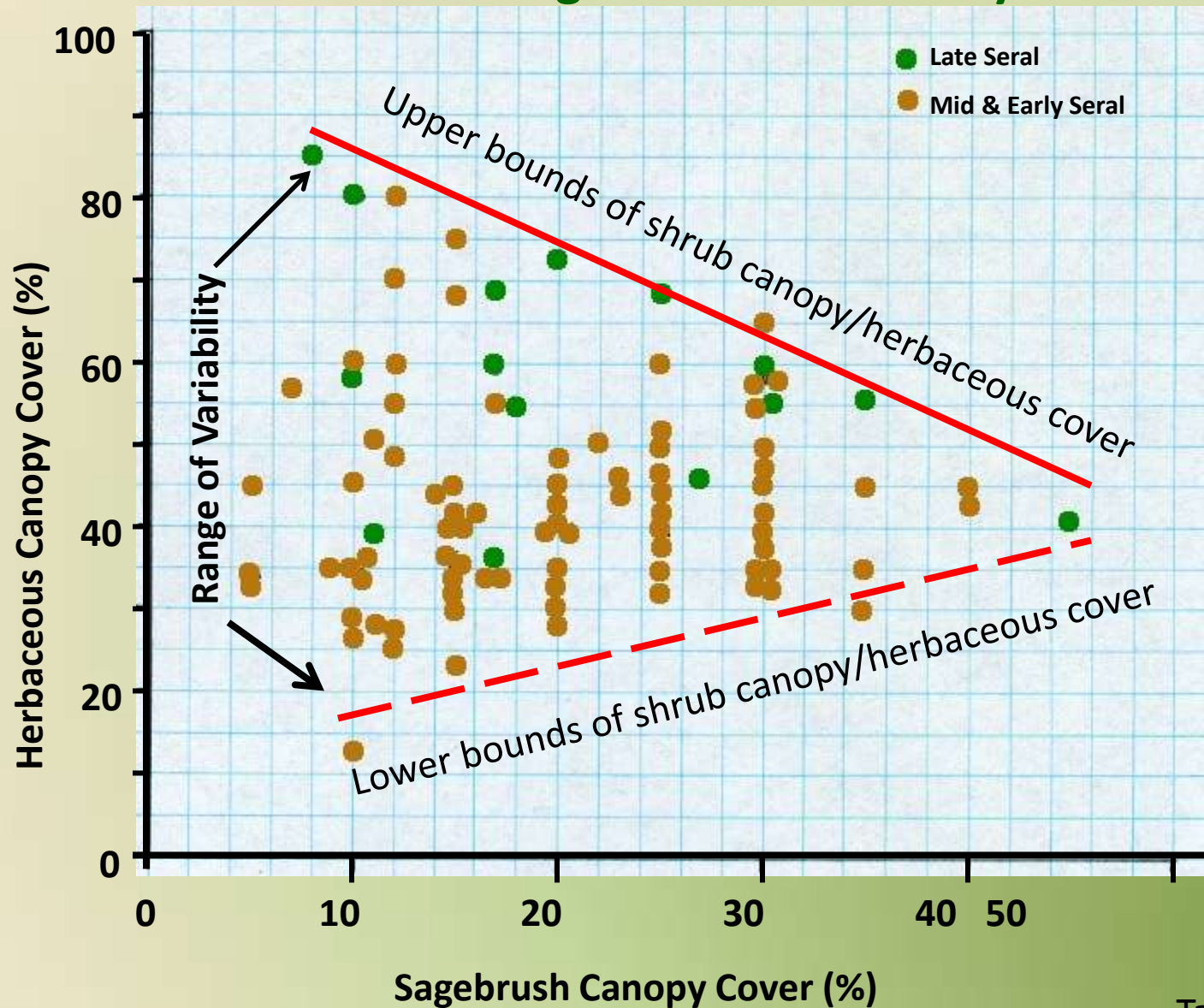
Connelly et al. (2000)

# Distribution of Sagebrushes

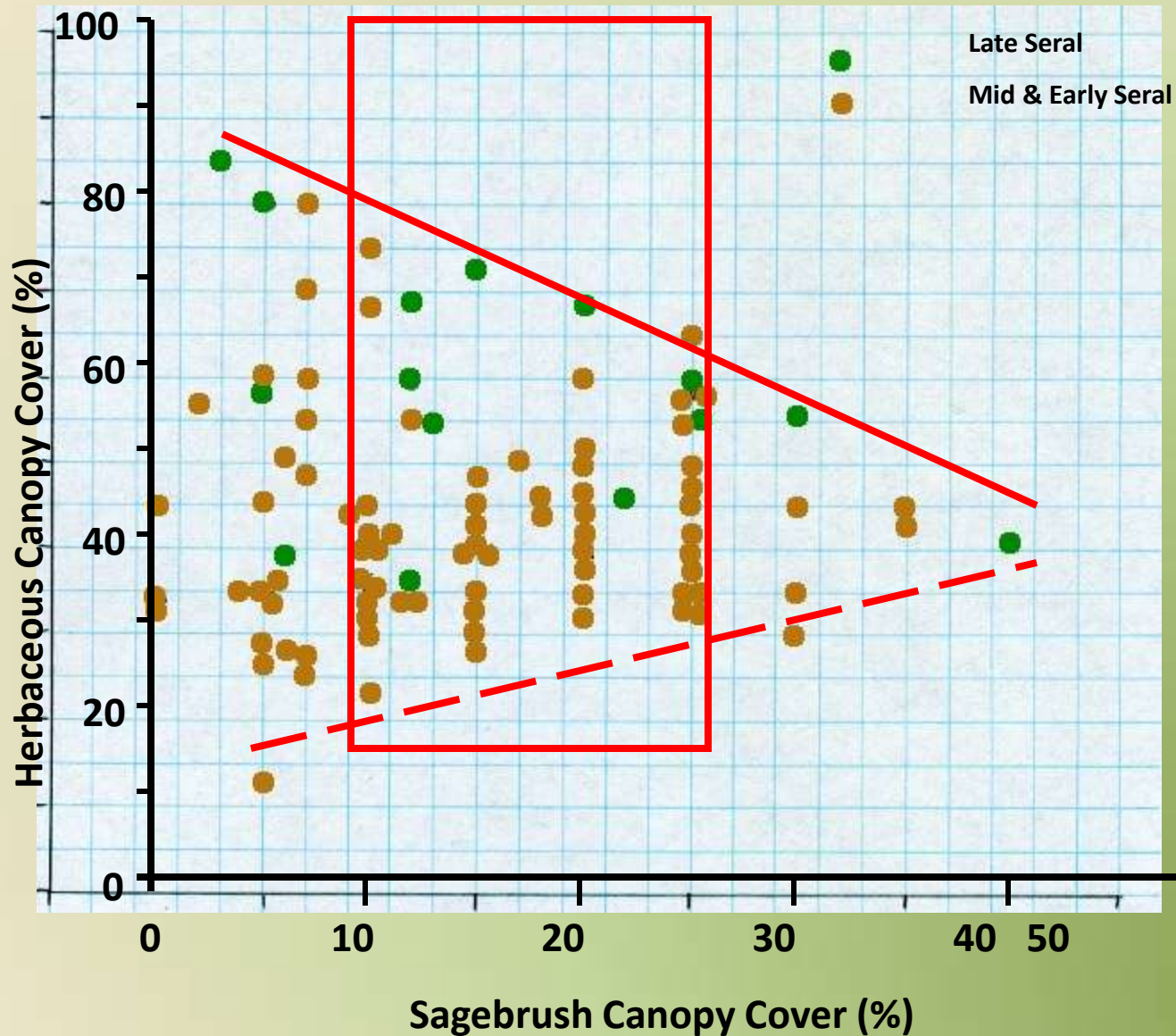
David Tart 5/15/2003



## Herbaceous vs Shrub Canopy Cover Mountain Sagebrush Community - WY

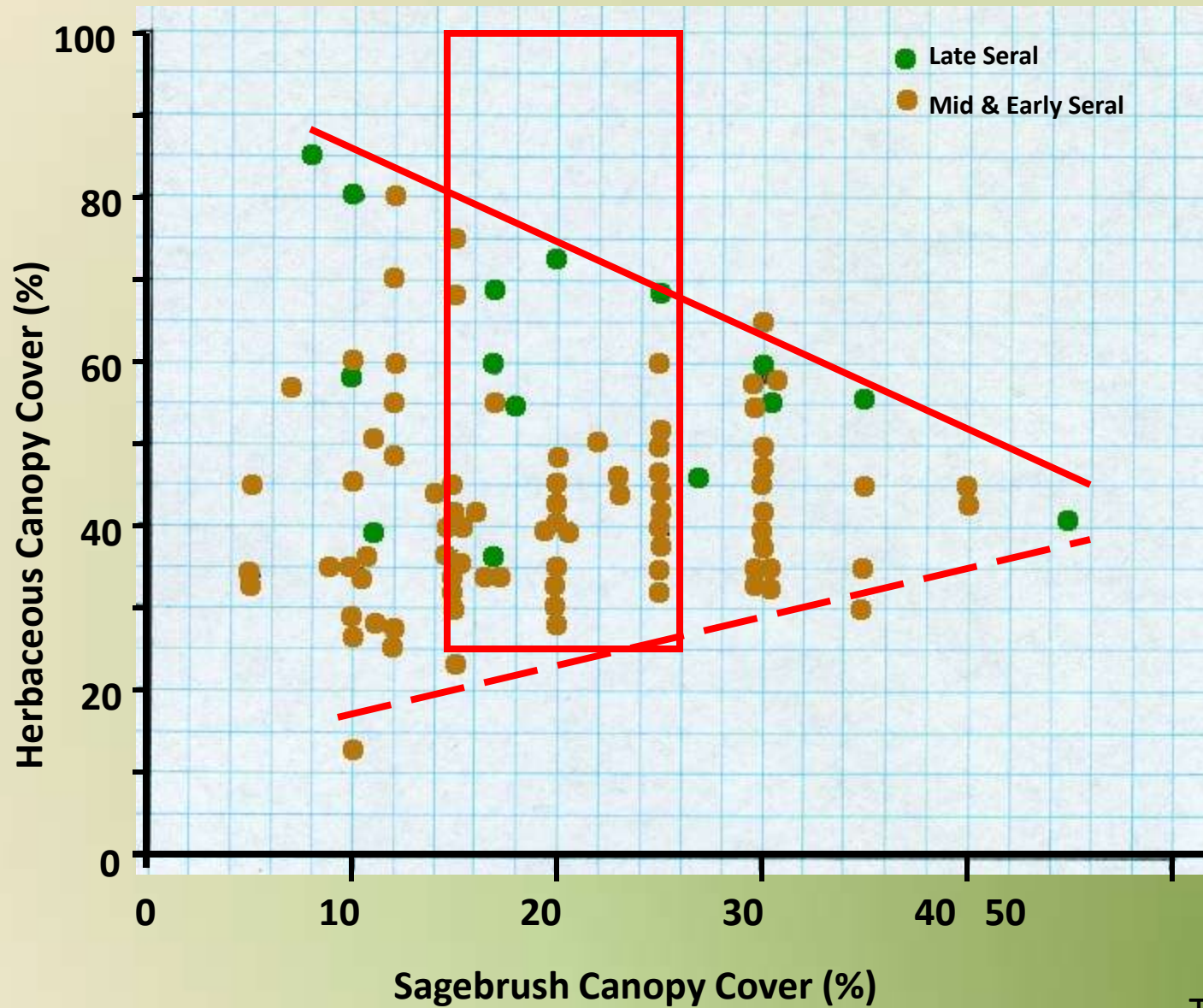


## Example: Sage Grouse Brood Rearing Habitat





## Example: Sage Grouse Nesting Habitat



## Tart (1996)





The challenge in managing sage-grouse habitats is to ensure habitat requisites are met at both fine and coarse scales, and account for seasonal habitats at these scales.

Yet, even when we understand the limiting factors, management options should assess uncertainties and risks to sage-grouse at various scales

# Assessing Uncertainty and Risks

Recovery or Restoration Probability	None to Slight (Functioning)	Moderate (Functioning at Risk)	State Changed Occurred (Non-functioning)
High	<b>No Action.</b> Monitor and adapt management as necessary	<b>Passive Restoration.</b> If unsuccessful, use active restoration.	<b>Active Restoration.</b> High priority, as potential for success is high.
Medium	<b>No Action.</b> Monitor and adapt management as necessary	<b>Passive Restoration.</b> If unsuccessful, use active restoration.	<b>Active Restoration.</b> Lower priority as potential for success is lower.
Low	<b>No Action.</b> Monitor and adapt management as necessary	<b>No Action.</b>	<b>Inventory.</b> Adjust management for new site conditions.

**Reassess the Need  
Evaluate Management  
And Modify, as needed**



**Assess Needs and Design  
Management Approaches**



**“Consequently,  
all adaptive management models  
need significant commitment  
and rigorous application of  
technique so managers can  
“learn by doing” at each  
conservation scale.”**



**Evaluate the Effectiveness  
of the Management**

**Monitor Management**



**Implement Management**

# Current Literature To Guide Management

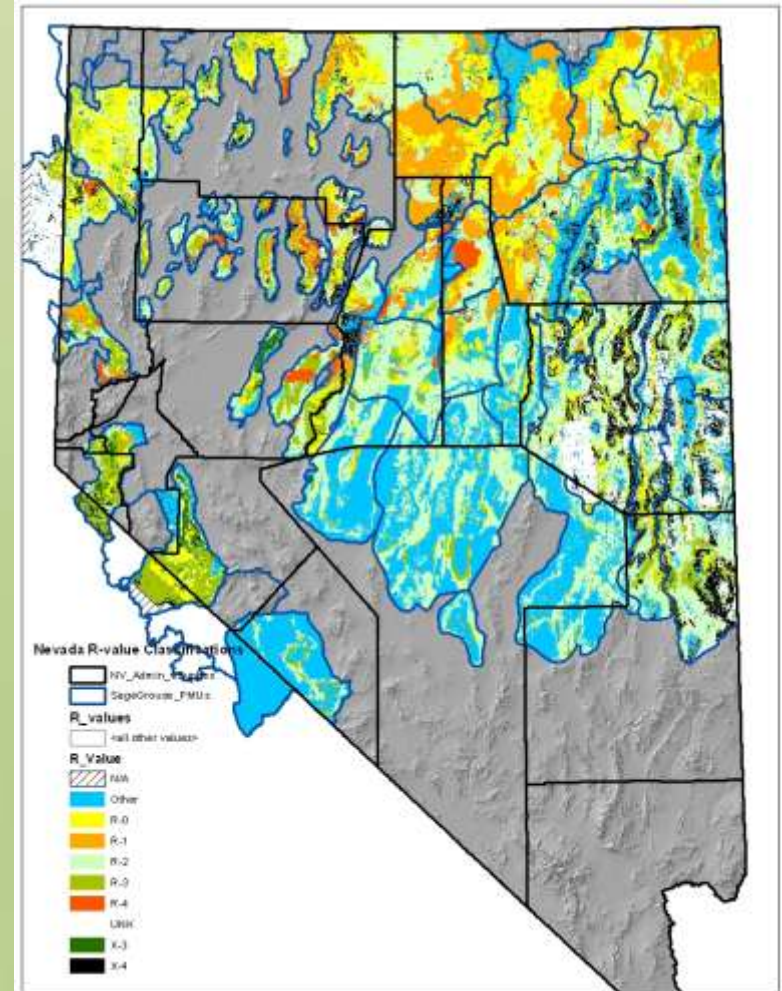
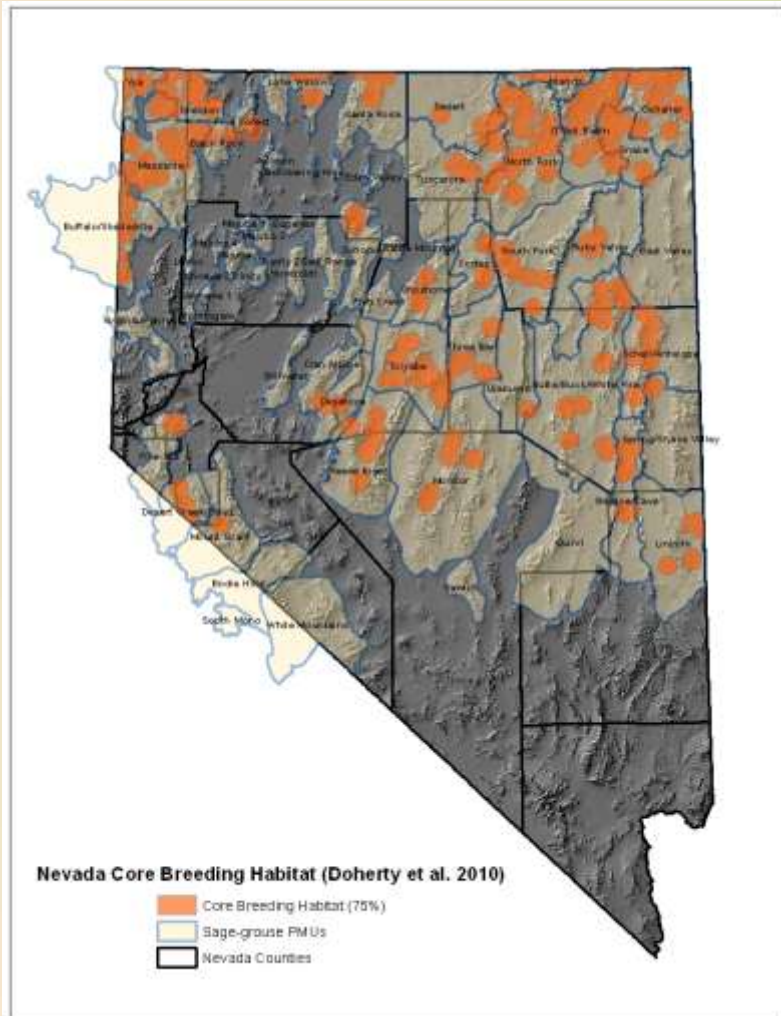
## Some Examples:

- Habitat Framework Assessment
  - Multi-scale Habitat Assessment Tool (2010)
- Greater Sage-Grouse: Ecology and Conservation of a Landscape Species and Its Habitat
  - <http://www.ucpress.edu/book.php?isbn=9780520267114>
- State Conservation Planning Efforts





# Prioritizing Conservation in Nevada

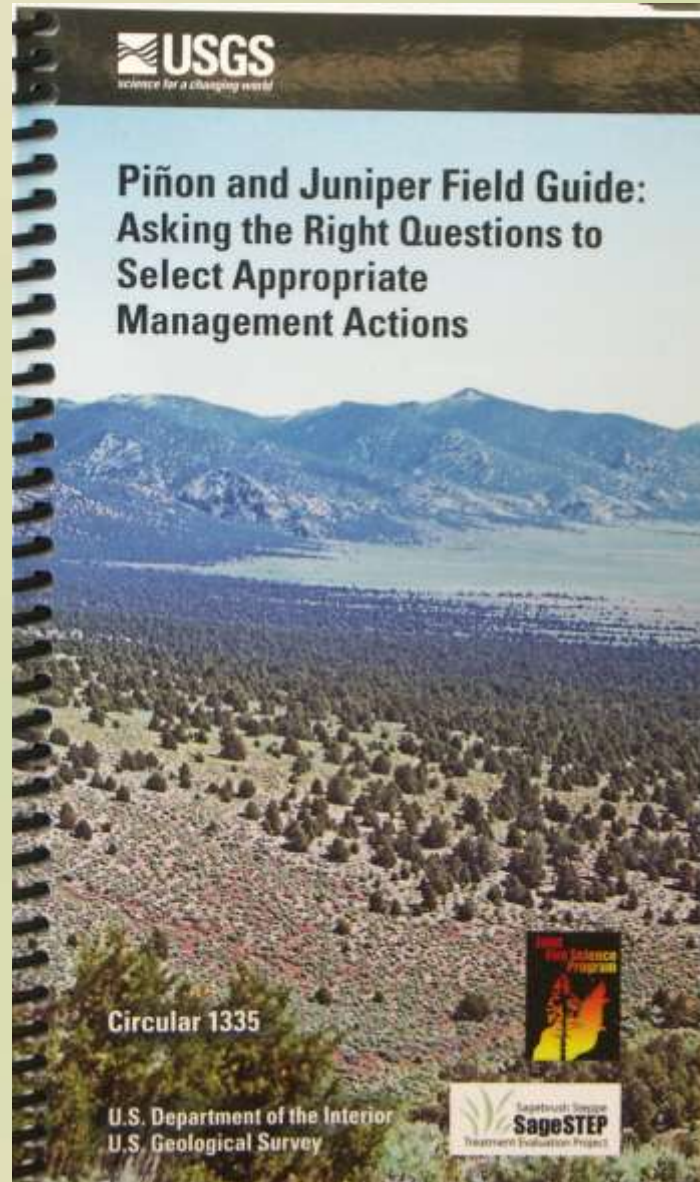


# Fitting It All Together Into a Process

(Need for a Decision Support Tool Field Guide)

- Considers scale in addressing the context of proposed management actions
- Links to sage-grouse habitat requisites
- Considers site characteristics relative to management actions
- Assesses treatment as just one facet of management actions
- Sets the stage for how we can manage habitats in an integrated manner
- Useful for managers when making decisions on management approaches

# Management Guide Example





The End



Photo by Ian Tait